



MicroLink Devices

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21st NREL Industry Growth Forum

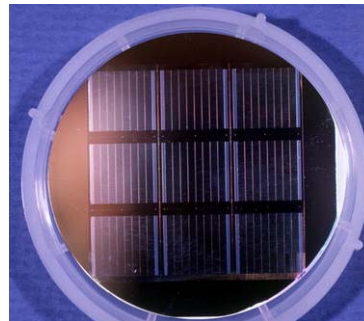


Business Model

- MicroLink has a proprietary, patented liftoff technology for making high performance solar cells
 - 50% of the costs incurred by other manufacturers of similar cells
 - Superior efficiency performance
- Make cells and receivers for use in solar concentrators
 - Also attractive for space applications



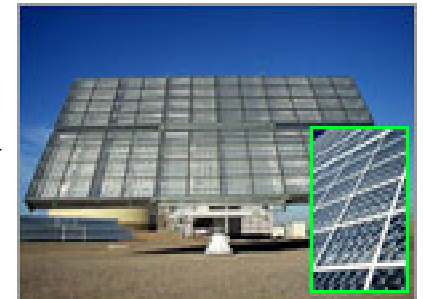
Growth



Processing



Packaging



Concentrator



Company History

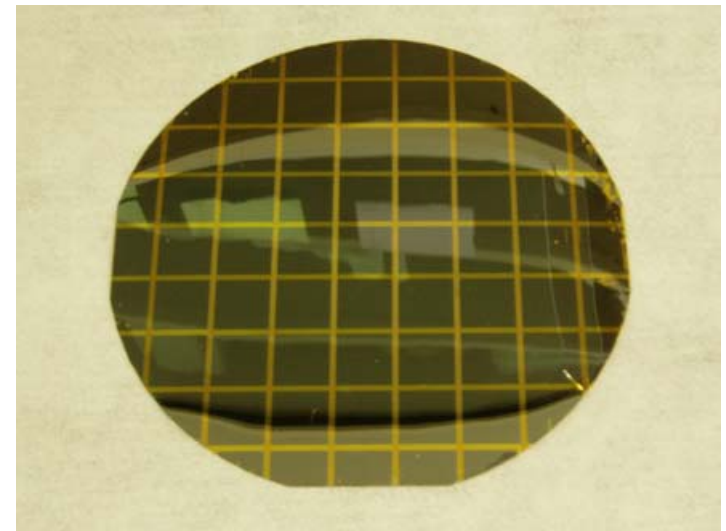
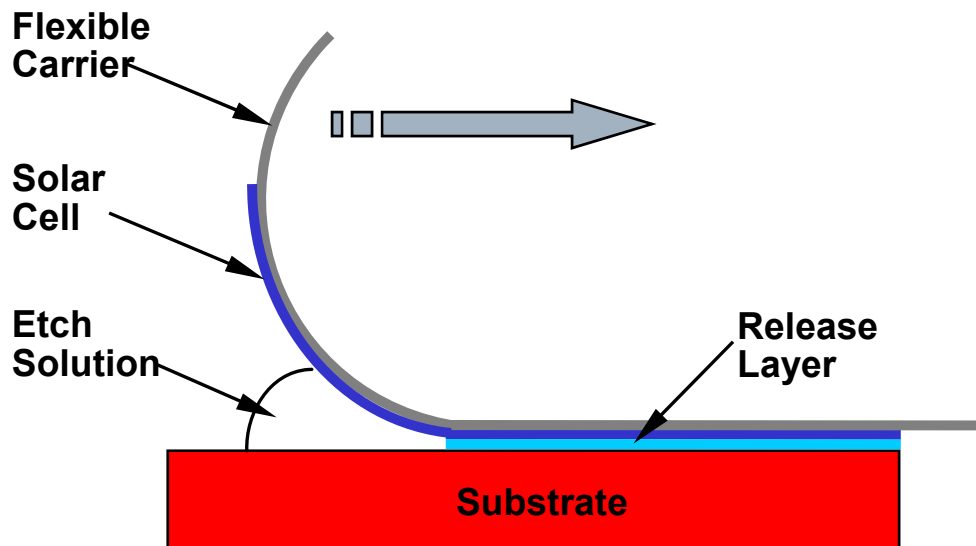
- ❑ MicroLink was founded in 2000
 - Fabricate transistor structures for wireless communications equipment
 - Complete semiconductor fab
 - ISO 9001 qualified
- ❑ Technology and facilities being applied to solar cells
- ❑ Company owned by small group of private investors
- ❑ \$7 million revenue
 - Profitable
 - Positive cash flow



Technical Advance: Epitaxial Liftoff



- Wafer-scale epitaxial liftoff allows solar cells to be removed from the substrate on which they are fabricated





Product Advantages

- Reuse substrate \Rightarrow 50% lower cost
 - Lower-cost replacement for solar cells in concentrators
- Higher cell efficiency
- No-one else is capable of performing wafer-scale liftoff
- Barriers to entry
 - Patent protection: three patents in process; owned by MicroLink
 - Proprietary process
 - Trade secrets



Achievements and Next Steps

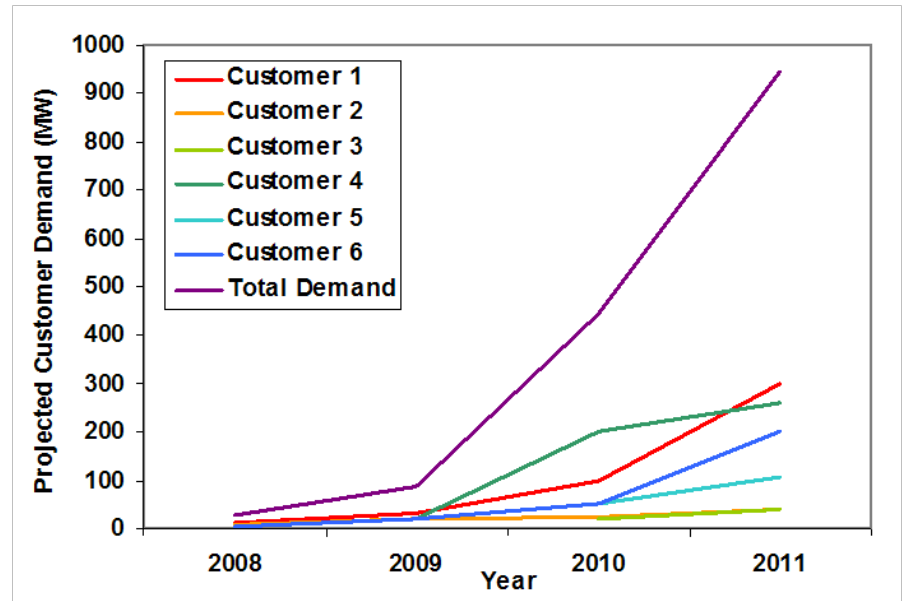
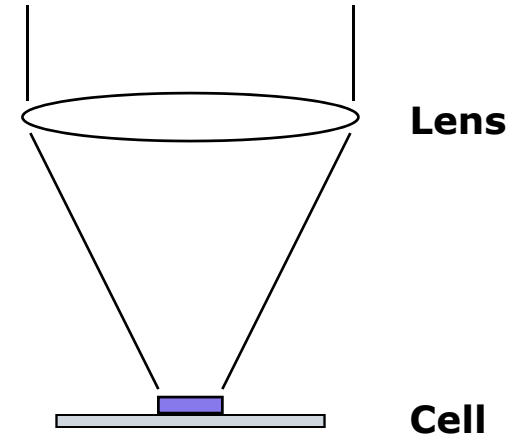
- 27% efficient cell at 1 sun
 - Verified by NREL
 - 32% efficient at 500 suns
- Better efficiency than conventional solar cells
- Fabricated arrays of cells from 4-inch wafers
- Cells mounted for use in concentrators

- Increase efficiency to 32% at 1 sun
 - 35% to 36% at 500 suns
 - Complete by end Q1 09
- Develop a manufacturable process
 - Liftoff and fabrication repeatable
 - Setting up a pilot line
 - Complete by end Q4 08



Target Market

- Concentrator makers
 - ~25 companies total
 - Globally distributed
- Markets are growing rapidly
 - Project >\$400M by 2013
- Key trend is growing popularity of concentrators
 - More energy per peak watt of capacity
- Reach by direct contact with key engineers, managers





Competition

- ❑ Established cell manufacturers: Spectrolab, Emcore, Azur
 - Large and well established companies
 - But, focus is on space solar

- ❑ New entrants
 - Similar to MicroLink

- ❑ Concentrator solar cells will quickly become a commodity
 - Differentiation is key to success
 - Proprietary product with superior performance and inherently lower cost



People

- Very strong management and technical team:
 - Noren Pan, Founder and CEO
 - Grew Kopin to \$80M/year
 - Chicago Entrepreneur of the Year, 2007
 - Rao Tatavarti, Cell Development
 - Developed new semiconductor devices at Nortel
 - Glen Hillier, Cell Growth
 - Fabricated optical device structures at Nortel
 - Chris Youtsey, Cell Processing
 - Large scale device fabrication at TriQuint
 - Ray Chan, Cell Packaging
 - Device processing at TriQuint
 - David McCallum, Marketing
 - Development and marketing of fiber optics at Molex
- Currently have 25 employees
 - All technical, support and administrative functions filled



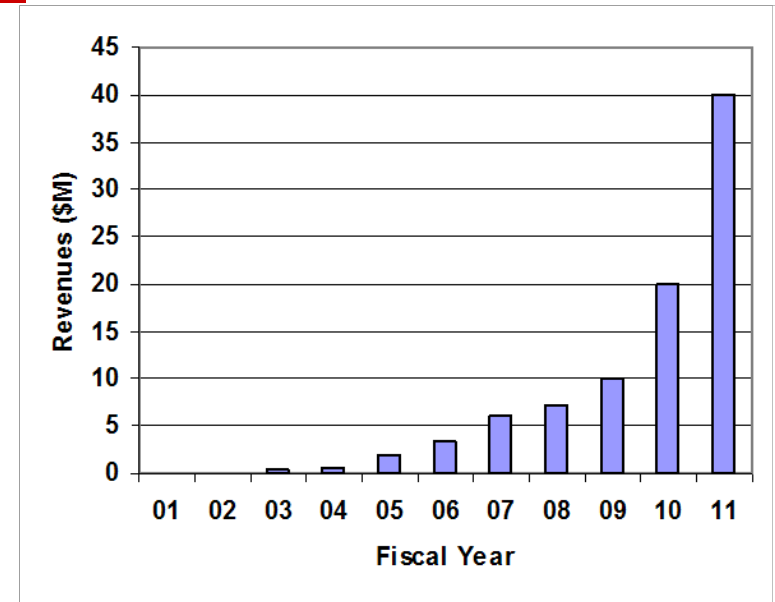
Success Factors

- ❑ Technology development
 - Improve efficiency and reduce cost
 - Performance-cost balance at least as good as competitors
- ❑ Product qualification
 - Engage with customers and qualify cells early
 - Increasingly difficult as more cell vendors enter
- ❑ Manufacturing capability
 - Develop liftoff and fabrication process
 - Hundreds of thousands of cells per year capacity
- ❑ Product differentiation
 - Close interaction with customers
- ❑ Maintain barriers to entry
 - More patents and trade secrets
- ❑ Round out team



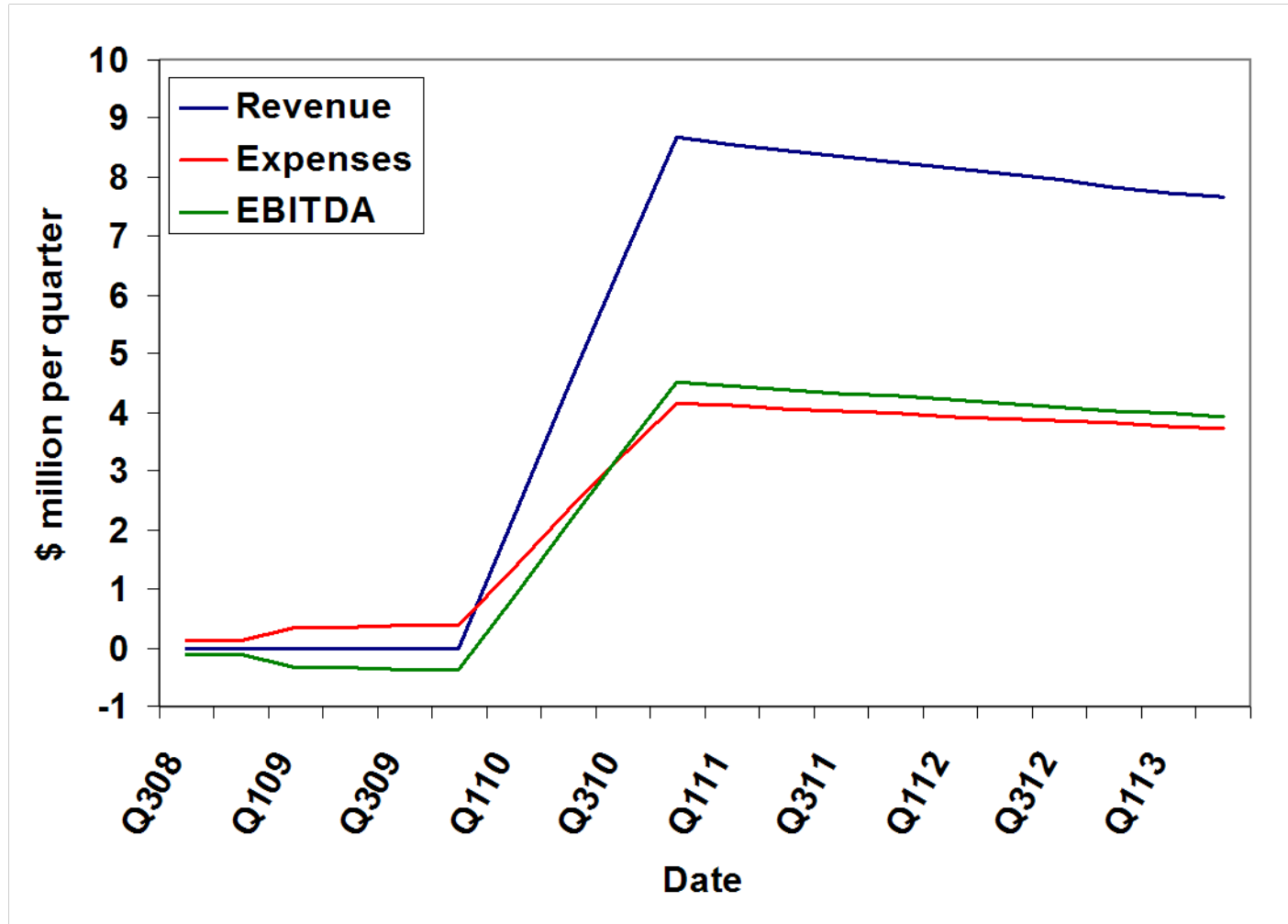
Financials

- Currently have \$7M revenue
 - Mixture of transistors and R&D
- Grow to ~\$40M within 3 years
 - Mainly solar cells
 - 50 MW capacity
 - Expect margins >50%
- Need \$9 million investment
 - Capex \$6.8 million
 - Balance for development and qualification program
- Plan exit via IPO or sale





Financial Model



Summary



- ❑ Proprietary, patented technology for making concentrator solar cells at 50% lower cost
- ❑ Leverage existing manufacturing facility and expertise
- ❑ Have identified ~25 potential customers
- ❑ Need \$9 million investment
- ❑ Plan exit via IPO or sale